for contacting the tympanic membrane and imparting audible vibrations without exerting essentially any static forces thereto.

REMARKS

Examiner's objection to the drawings as allegedly not showing the vibratory element as part of the filament assembly, and therefore, as not complying with 37 CFR 1.83(a), is not understood. Accordingly, the objection to the drawings is respectfully traversed. Vibratory element 45 of filament assembly 30 is clearly shown in the drawings, for example, in FIGS. 4-9, and the vibratory element is clearly described in accompanying text of the specification as being part of the filament assembly.

The status of the claims is as follows. Claims 41 and 83 stand objected to for use of a phrase which is deemed unacceptable by examiner. Claims 1-40 stand rejected under 35 U.S.C. 112, first paragraph, allegedly because the specification fails to teach or show a vibratory element as part of the filament assembly; claims 1-40 further stand rejected under 35 U.S.C. 112, second paragraph, allegedly as being indefinite for failure to particularly point out and distinctly claim the subject matter which applicant regards as the invention, on various grounds specified by examiner; claims 1, 3, 9, 13, 20-22, 24-25, 30, 34-36, 83, 85 and 87-89 stand rejected under the judicially created doctrine of obviousness-type double patenting, allegedly as being unpatentable over claims 1-3, 13, 17, 23, 28, 38-41, 44, 46, 47, 68 and 77 of U.S. Patent No. (US) 6,137,889 to Shennib et al (Shennib '889); and claims 1, 3-9, 13-16, 19-30, 32-37, 39-53, 55-74, 77, 79 and 81-94 stand rejected under 35 U.S.C. 102(e) allegedly as being anticipated by Shennib '889. Claims 54, 75-76, 78 and 80 stand objected

to as being dependent upon a rejected base claim but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 41 and 83 have been amended to overcome examiner's objection to the terminology "one degree of motion freedom." Specifically, the word "motion" has been deleted from each of those claims.

The rejection of claims 1-40 under 35 U.S.C. 112, first paragraph, is respectfully traversed. Examiner's contention with respect to the specification as allegedly not providing enablement for vibratory element [sic] as part of the filament assembly is not understood. As is clearly described in the specification -- at page 15, for example -- "the filament assembly 30 comprises a vibratory element 45 which responds to vibration forces produced by vibration force element 70." The vibratory element is consistently described in the specification and shown in the drawings as being part of the filament assembly.

Just as clearly, the specification is not, as examiner contends, enabling for the vibratory element as part of the "vibrating" force element. The vibration force element does not include a vibratory element as those terms are used in the specification. The vibration force element 70 applies vibrational forces to the vibratory element 45 of filament assembly 30 through the medium of electromagnetic forces created by passing an output current representative of audio signals through the coil 71 of the vibration force element 70 (see, e.g., page 15 of the specification).

Accordingly, it is submitted that this rejection lacks merit and should be withdrawn.

The rejection of claims 1-40 under 35 U.S.C. 112, second paragraph, is -- generally -- respectfully traversed. Selected claims among claims 1-40 have been amended where the rejection is appropriate.

With respect to the rejection of claim 1: In claim 1, the term "vibratory element" is used in exactly the same way as it is used in and throughout applicant's specification. With all due respect, examiner's apparent confusion concerning what the term refers to is baffling. Claim 1 does not recite a "coupling element" as part of the filament assembly, and, as pointed out above, neither claim 1 nor the specification recites a vibratory element of the vibration force element. Moreover, as is clearly stated at page 13 of the specification, the filament assembly 30 includes a thin elongate vibrational conductive member (filament shaft 40) and a tympanic coupling element (tympanic coupling pad 60) that is placed on the tympanic membrane 18 of the wearer of the hearing device. So "coupling element" (which, again, is not recited in claim 1) is clearly distinct from "vibratory element", albeit both are encompassed by the term "filament assembly" as used in the specification and the claims.

With respect to the rejection of claim 7: Claim 1 recites, among other things, that the "filament assembly is dynamically coupled to a stationary vibration force element positioned in the ear canal." Claim 7 recites that "said filament assembly is separable from said vibrational force element for placement and replacement therein." The term "therein" generally refers to the last immediately preceding noun or subject in the sentence in which it is used. Thus, in this case, "therein" refers to vibrational force element. That is, the filament assembly can be placed in or replaced onto or from the vibration force element. See page 15, lines 21-24 of the specification, for example. Claim 7 has been amended to clarify the point.

With respect to the rejection of claim 11: Claims 11 and 12 have been amended to correct their line of dependency from claim 9 to claim 10. As amended, both dependent claims have antecedent basis for the limitation "said permanent magnet," from claim 10.

With respect to the rejection of claim 82: Claim 82 has been amended to correct the term "tympanic contact element" in lines 6 and 7 to read: -- tympanic coupling element --. It is noted, incidentally, that claim 82 is not included in the overall statement of rejection of claims under 35 U.S.C. 112, second paragraph, but applicant assumes examiner had intended to include it.

The rejection of claims 1, 3, 9, 13, 20-22, 24-25, 30, 34-36, 83, 85 and 87-89 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3, 13, 17, 23, 28, 38-41, 44, 46, 47, 68 and 77 of Shennib '889 is respectfully traversed.

Generally speaking, Shennib '889 describes and claims structure for direct tympanic membrane excitation via a vibrationally conductive assembly. As noted in the present specification in the paragraph bridging pages 7 and 8, the '889 patent describes a canal hearing device having a thin elongated vibrational assembly which directly contacts the tympanic membrane causing audible vibrations. The canal hearing device uses strain relief methods to seek to minimize static pressure on the tympanic membrane by the coupled vibrational assembly. But device movements within the ear canal or changes in the atmospheric pressure affecting the position of the tympanic membrane can cause variations in both static and dynamic coupling that will adversely affect the perceived sound as well as the

comfort of wear of the device. The effect of changes in the static coupling is also undesirable because they introduce distortion and other adverse electroacoustic parameters.

It should be observed, then, that in essence, the prior art seeks to *minimize* static pressure on the tympanic membrane, whereas the present invention eliminates static pressure.

As observed in the first paragraph of the specification under the heading "Summary of the Invention," at page 8, the present invention provides a canal hearing device having a miniature vibratory filament assembly which directly drives the tympanic membrane and imparts audible vibrations thereto. In contrast to the invention disclosed and claimed in Shennib '889, the filament assembly of the present invention is partially supported by the tympanic membrane via weak adhesion thereto and is dynamically coupled to a stationary vibration force element positioned at a distance from the tympanic membrane within the ear canal, such that the elongated filament assembly is freely movable within an operable range and is essentially floating with respect to the vibration force element. This type of dynamic coupling between the filament assembly and the force transducer essentially eliminates static forces on the tympanic membrane, thus offering safe and comfortable wear. The freedom of movement attributable to this dynamic coupling allows for individual variations in the positioning of the hearing device within the ear canal while providing essentially zero static pressure on the tympanic membrane, regardless of the exact position of the canal hearing device.

Base claim 1 of the present application calls for "a statically floating filament assembly ... adapted to fit within the ear canal ... for contacting the tympanic membrane directly and imparting audible vibrations thereto, said filament assembly being dynamically

coupled to a stationary vibration force element positioned in the ear canal at a distance from the tympanic membrane, said filament assembly comprising: (a) a vibratory element ..., and (b) a vibrational shaft element ..., said filament assembly being freely movable within an operable range with respect to said vibration force element, thereby allowing individual adjustment and positioning of said filament assembly for contacting the tympanic membrane and imparting audible vibrations without exerting static forces thereto." [Emphasis added]. Each of dependent claims 2-40 of the present application contains the same limitations along with their respective additional limitations that further define the filament assembly.

Base claim 83 recites "a hearing device ... adapted to fit and be worn within the ear canal of a human subject for imparting audible vibrations to the tympanic membrane ..., comprising: ... a vibration force element responsive to ... amplified signals for conversion thereof to dynamic forces representative of said incoming signals; and a vibrational filament assembly dynamically coupled to said vibration force element and responsive to said dynamic forces imparted on by said vibration force element, said vibrational filament assembly being essentially free floating within an operable range in at least one degree of freedom with respect to said vibration force element, thereby allowing individual adjustment and positioning of said vibrational filament assembly for contacting the tympanic membrane and imparting audible vibrations without exerting essentially any static forces thereto." [Emphasis added].

Base claim 85 calls for "a method of imparting audible vibrations on the tympanic membrane of an individual comprising the steps of: (a) attaching a vibratory filament assembly ... to the tympanic membrane; and (b) imparting mechanical vibrations

representative of audio signals on ... said vibratory filament assembly; and (c) dynamically coupling said vibratory filament assembly to a vibration force element whereby said vibrational filament assembly is essentially free floating within an operable range, in at least one degree of motion freedom, with respect to said vibration force element to allow individual adjustment and positioning of said vibrational filament assembly for contacting the tympanic membrane and imparting audible vibrations thereto without exerting essentially any static forces." [Emphasis added].

None of the claims of Shennib '889 contain anything comparable to the above-emphasized limitations of the claims of the present application, as to constitute a basis for asserting obviousness-type double patenting. The differences between the claims of this application and the claims of Shennib '889 are not mere obvious modifications of structure, function or method. In other words, they are differences in kind, not mere differences in degree. If examiner persists in the double patenting rejection, applicant respectfully requests a detailed explanation of the grounds for the rejection. Shennib '889 may contain claims of broader scope than those of the present application, but the former is entitled to do so and, in any event, that in and of itself is not a reason for asserting obviousness-type double patenting.

Moreover, other claims of the present application not included in this rejection contain limitations similar to those emphasized above in the claims that are included. For example, main claim 41 calls for "a canal hearing device adapted for directly contacting the tympanic membrane and imparting audible vibrations thereto, comprising: (a) a floating vibrational filament assembly for contacting the tympanic membrane at its medial end, (b) a stationary vibration force element ... operably associated with said vibrational filament assembly, said

vibrational filament assembly being responsive to dynamic forces imparted thereon by said vibration force element for movement freely within an operable range in at least one degree of freedom with respect to said vibration force element, thereby allowing individual adjustment and positioning of said vibrational filament assembly for contacting the tympanic membrane and imparting audible vibrations without exerting essentially any static forces thereto." [Emphasis added]. By definition, each of claim 41's dependent claims 42-81 contains those same limitations along with respective additional limitations that further define the canal hearing device.

What is it in those claims that has led examiner to exclude them from the same rejection? With all due respect, it is submitted that no basis exists for a double patenting rejection of any claim of the present application vis-a-vis Shennib '889, obviousness-type or otherwise. The rejection is clearly erroneous and should be withdrawn.

The rejection of claims 1, 3-9, 13-16, 19-30, 32-37, 39-53, 55-74, 77, 79 and 81-94 under 35 U.S.C. 102(e) as being anticipated by Shennib '889 is also respectfully traversed. Both the disclosure of the present application and the disclosure of Shennib '889 are discussed above, in pertinent part. This rejection, too, is clearly erroneous and should be withdrawn.

Examiner contends that each and every element of claim 1 of the present application is disclosed in Shennib '889. Really? Where, specifically, does Shennib '889 disclose "a statically floating filament assembly,"or a "filament assembly freely movable within an operable range with respect to a vibration force element, thereby allowing individual adjustment and positioning of said filament assembly for contacting the tympanic membrane

and imparting audible vibrations without exerting static forces thereto." In purported support of the contention, examiner cites Shennib '889 as disclosing a "statically floating filament assembly 38", a "vibration force element 40," a "vibratory element 31," in the text and "figures 5-11".

However, an examination of the '889 patent itself -- for example, the text referencing:

- FIG. 5 at column 8, lines 11-21,
- FIGS. 6-8 at column 8, lines 48-52,
- FIG. 6 at column 9, lines 18-29,
- FIG. 7 at column 9, lines 31-36, and
- FIGS. 7 and 8 at column 9, lines 53-65,

reveals that the patent contains no such disclosure of elements. In particular, Shennib '889 fails to disclose or to suggest a "statically floating filament assembly," or a "filament assembly freely movable within an operable range with respect to a vibration force element, thereby allowing individual adjustment and positioning of said filament assembly for contacting the tympanic membrane and imparting audible vibrations without exerting static forces thereto," as required (among other limitations) by claim 1.

Rather, in the '889 patent, the filament assembly 38 is fixedly attached to vibratory transducer 40 by means of the connection between filament shaft 30 of the filament assembly 38 and vibrating armature 81 of vibratory transducer 40. In one embodiment the attachment is permanent; in the other two, the attachment is detachable but is accomplished only by exerting a substantial force. If it were otherwise in any of the embodiments of Shennib '889,

the device would fail in its basic purpose to convert audio signals to audible vibrations to be imparted to the tympanic membrane.

The same analysis applies to the other main (independent) claims of the present application cited by examiner as allegedly anticipated by Shennib '889. And since the main claims are not anticipated, neither are their respective dependent claims.

The other references cited but not applied by examiner have been reviewed but are not found to cure the deficiencies of Shennib '889 as a reference against applicant's claims.

Examiner's indication of the allowability of claims 54, 75-76, 78 and 80 is noted with appreciation but since all of the claims, as amended, are submitted to be patentable over the references of record, it should be unnecessary to rewrite those claims in independent form.

Applicant also notes that examiner completed an International Preliminary Examination Report on 11/18/01 on international application PCT/US00/34265 (the IPE Report) which is identical in specification and claims to the present application, one day before the Office Action to which this Amendment is a response was signed off by examiner. The Office Action was mailed on 11/29/01, and the IPE Report was mailed on 12/28/01. The IPE Report states the examiner's determination that all 94 claims of the international application meet the novelty, inventive step, and industrial applicability criteria of the applicable PCT Articles, with no citation of references therein for any purpose whatsoever. The discrepancy between the two examinations, conducted at or about the same time by the same examiner, is not understood by applicant. An explanation is requested.

A clean copy of the amended claims 7, 11, 12, 41, 82 and 83 is contained in Attachment A to this Amendment.

In view of the foregoing amendments and remarks, it is respectfully submitted that this application is in condition for allowance. Such favorable action is earnestly solicited.

Respectfully submitted,

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